Figure 18
Larsen Bay

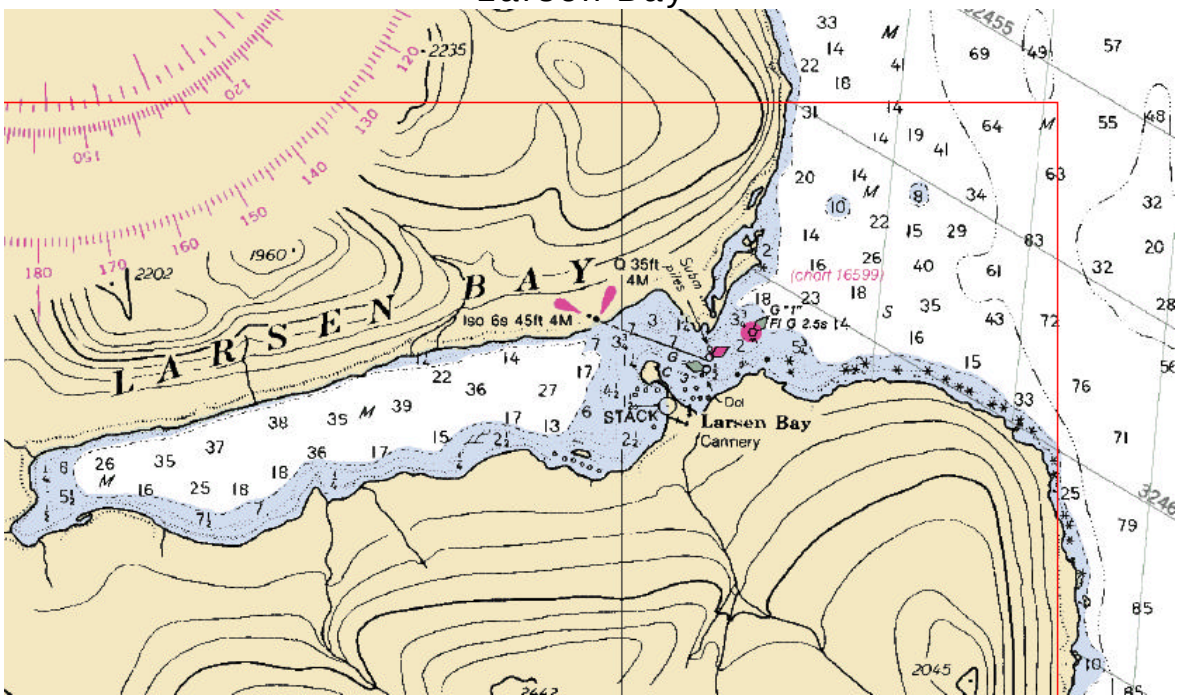
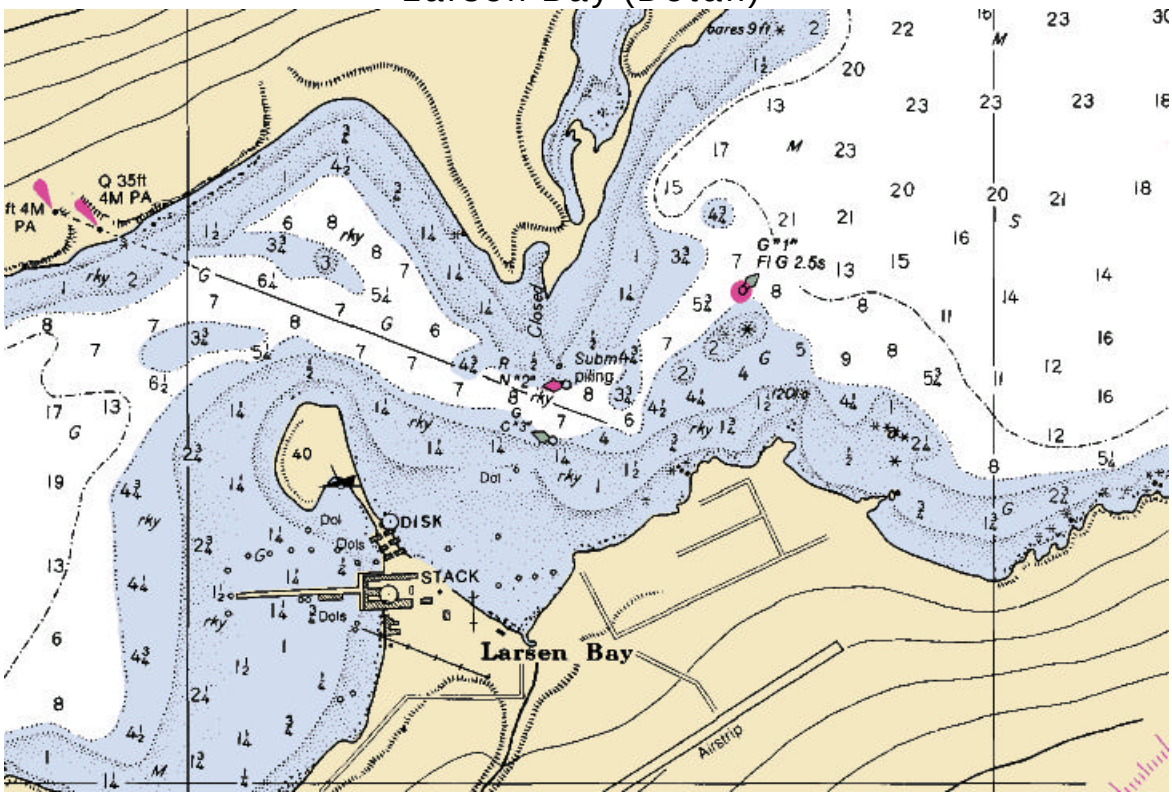


Figure 19
Larsen Bay (Detail)




*PORT O'BRIEN (CHARTS 16576 AND 16597)*

The cannery at Port O'Brien, 2.2 miles SE of Starr Point in Uganik Bay, has a wharf 390 feet long with a 105-foot face and a depth of about 32 feet alongside. The oil wharf parallel to this main wharf is of equal length with a 30-foot face, and has a depth of about 20 feet alongside. Both canneries store fuel oil, diesel oil, and gasoline for their own use and have an abundant supply of water. They have some machine shop facilities and scow ways. Tides of 16.5 feet are necessary to use these ways. There are no marine railways. The cannery at Port O'Brien maintains radiotelephone and radiotelegraph communications.

Deep water surrounds Sally and Sheep Islands except for the narrow passage between Sheep Island and the mainland, where it is nearly bare.

A shoal with a least depth of 5¼ fathoms, sand and gravel bottom is about 300 yards N from the N tip of Sally Island.

Anchorage may be had off the cannery in about 30 fathoms.

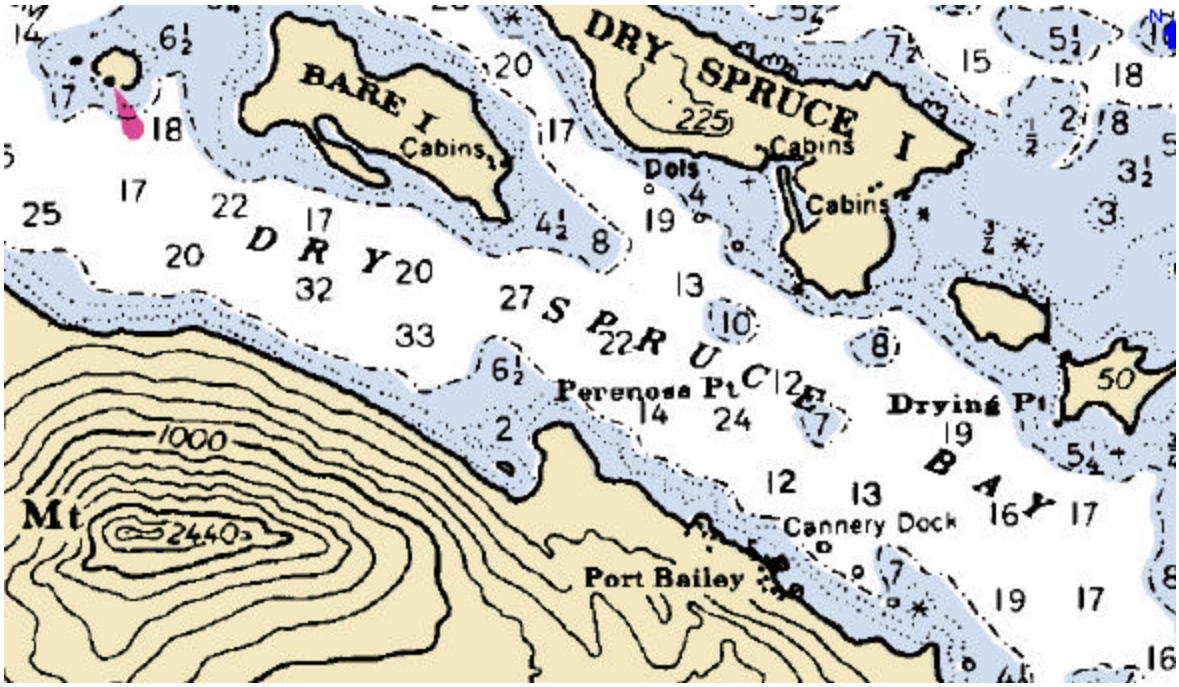
*PORT BAILEY (CHART 16594)*

Port Bailey cannery and wharf are on the S shore of Dry Spruce Bay. The cannery is operated by Columbia-Wards Fisheries and manned from about mid-May through August. During the open season, the services of a nurse are available and water can be had at the wharf. The cannery has a machine shop and a store; emergency supplies of diesel fuel and gasoline are usually available. The 150-foot-long wharf has depths of 27 feet alongside. Unlighted mooring dolphins are along the shore SE of the cannery.

Air service is available to and from Kodiak once a week during the off season and daily except Sunday during the open season.

The best anchorage for large vessels is about 0.5 mile E of Bare Island and 0.4 mile off the cove in Dry Spruce Island, in 16 to 19 fathoms. A small vessel can anchor in the middle of the entrance to this cove in about 6 fathoms, taking care to keep clear of the flat, that extends 250 yards from its NE side, and the unlighted mooring dolphins across the entrance to the cove. With strong SW winds, some williwaws are felt from Kupreanof Mountain. A midbay rock awash is 0.8 mile from the head of Dry Spruce Bay.

Figure 20
Port Bailey



## *PORT LIONS (CHART 16594)*

Port Lions is the name given in 1965 to a settlement near the head of Settler Cove, created when all the inhabitants of Afognak moved in and declared it their new home. A good small-craft anchorage is 0.5 mile NE of the village. Two breakwaters forming a small-boat harbor are about 0.5 mile NE of Port Lions. A light is on the E end of the outer breakwater, and a daybeacon marks the E side of the harbor entrance. The small-boat harbor has moorage for about 125 vessels. A graded landing field is here, providing Port Lions with mail service three times weekly from Kodiak. The Alaska State Ferry *Tustumena* currently makes regularly scheduled stops at Port Lions. For this reason, presuming the continuance of service to Port Lions by the *Tustumena*, it is suggested that Port Lions not be included among the ports receiving service from an Intra-Kodiak Island ferry.

## *OUZINKIE (CHART 16594)*

Ouzinkie is a small native village at the head of the cove in Spruce Island N of Prokoda Island. The most conspicuous features in the town are the warehouse close to the near shore of the cove, the Russian Orthodox Church spire, and the boardwalk which runs around the N side of the cove. Fishing is the principal industry in Ouzinkie.

An L-shaped pier, connected to land at both ends, is on the W side of the cove and can handle vessels up to 120 feet long and drawing about 15 feet. A grid of sawed-off pilings is along the E side of the pier; the grid is considered hazardous because of the steel spikes protruding upward from the piles. A foul area is about 100 feet SW of this pier.

A cannery and pier were built over the water on E side of the cove. The pier can accommodate vessels 80 feet long and drawing 12 feet. A rock, covered 6 feet, is 400 feet SSE of the S corner of the pier; the rock is usually marked with a fishing float.

On entering Ouzinkie from the E, care should be taken to avoid the reef that extends some distance off the SE shore of Prokoda Island.

### *Ouzinkie Point*

Ouzinkie Point, SW end of Sprude Island, is the point on the N side of the W entrance to Narrow Strait.

Kelp is close to Ouzinkie Point and the point should be given a birth of about 125 yards.

### *Entrance Point*

Entrance Point, on the S side at the W entrance of Narrow Strait. A kelp-marked shoal, with 7 to 12 feet over it, extends 250 yards N from Entrance Point. A rocky ledge, covered 7 feet and marked at the outer end by a buoy, extends about 325 yards NNE of the point.

### *Narrow Strait*

Narrow Strait, between Spruce and Kodiak Islands, is used by vessels bound from Kodiak to Shelikof Strait. It has a clear width of 1 mile at its E end, while at its W end the channel is 100 to 300 yards wide with a least depth of about 7 fathoms. With E gales a heavy swell sets into the strait, but this generally loses much of its force toward the W end.

Ouzinkie Narrows, the narrow passage of Narrow Strait in the vicinity of Otmeloi Point and Prokoda Island, is described later in this section.

The W approach to Narrow Strait is S of Three Brothers and across the buoyed 7-fathom bank 0.3 mile NNE of Low Island.

The best anchorage in Narrow Strait is in the middle of Ouzinkie Harbor between Prokoda Island and Ouzinkie, in 18 to 20 fathoms, somewhat exposed to an E. swell. A small vessel and small craft can anchor at the head of Ouzinkie Harbor near Ouzinkie, slightly favoring the W side, in 5 to 10 fathoms.

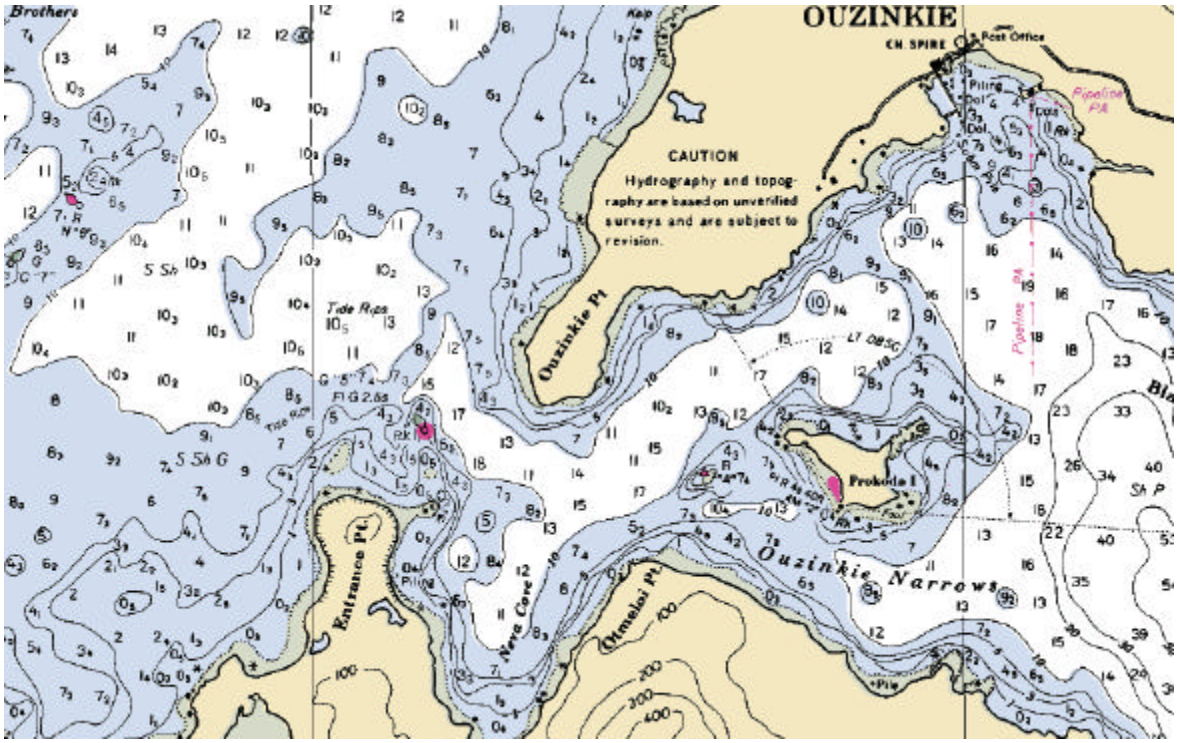
*Neva Cove*

Neva Cove, between Entrance Point and Otmeloi Point, provides good anchorage for medium-size craft from all winds except NW, in 13 fathoms, soft bottom.

*Ouzinkie Narrows*

Mariners using Ouzinkie Narrows, the narrow passage of Narrow Strait in the vicinity of Otmeloi Point and Prokoda Island, should be careful because the currents will set a vessel into danger rapidly. Depths of 5 fathoms or less extend 200 yards SE of Prokoda Island, and depths of 4 fathoms or less extend 200 yards N from the small mainland point 0.5 mile E from Otmeloi Point. Between these areas are depths of over 10 fathoms for a width of 150 yards.

Figure 21
Ouzinkie

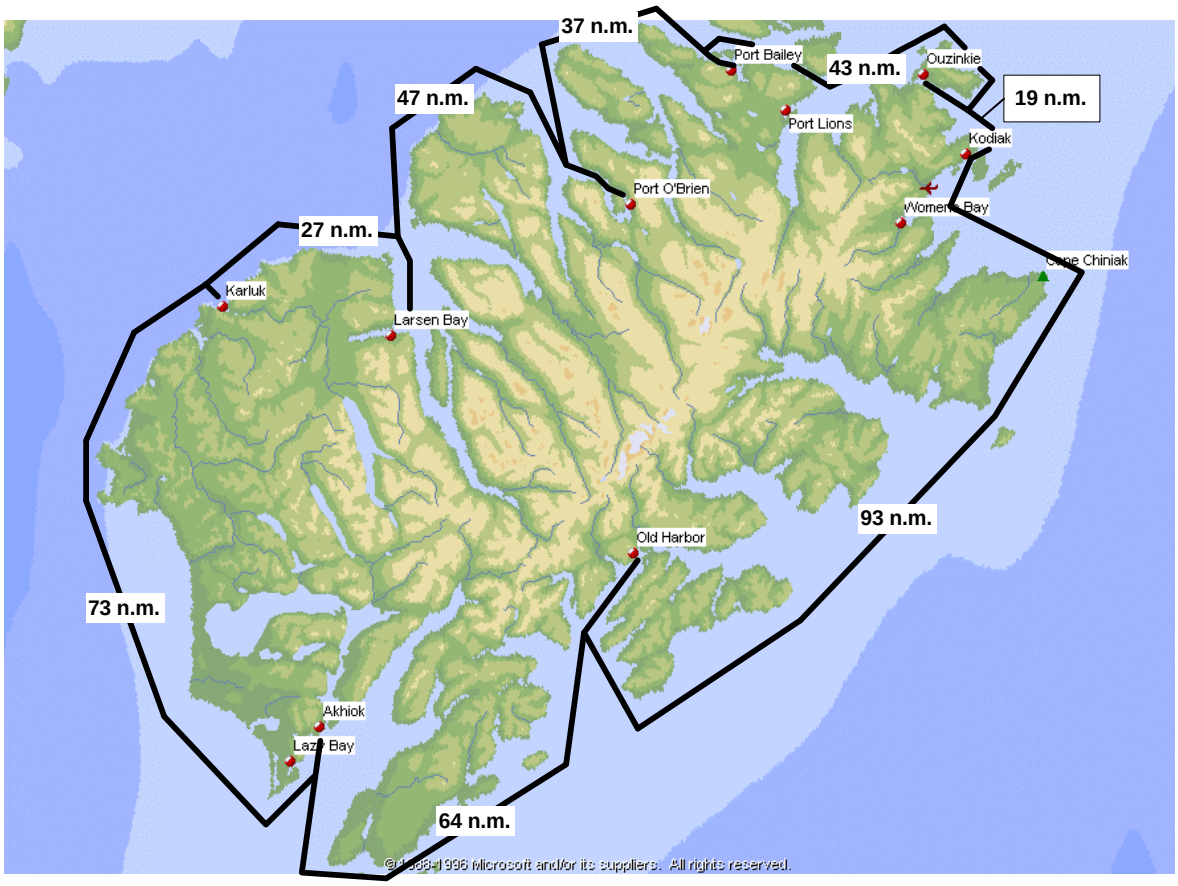



## Model Schedule

Figure 22 shows the approximate routes and running distances between the City of Kodiak and the following Kodiak Island outports:

- Old Harbor
- Akhiok
- Karluk
- Larsen Bay
- Port O'Brien
- Port Bailey
- Ouzinkie

Figure 22
Circumnavigation of Kodiak Island
Showing Running Distances




The total circumnavigation of Kodiak Island, calling at these ports, comprises 403 n.m. For a vessel with a nominal service speed of 11 knots the required running time to accomplish the circumnavigation is approximately 38 hours as shown in Table 48, including allowances for slow running when entering and departing ports, and when transiting difficult passages such as Whale Passage or Afognak Strait. Port times of from one to two hours are allowed at ports requiring lightering, with the longer port times being allowed at Akhiok and Larsen Bay where long lighterage runs may be required. Short port times of one-half hour are allowed in Port O'Brien and Port Bailey where the vessel can moor against a conventional dock. As shown in Table 48 the complete circumnavigation including port time allowances can be accomplished in a 48-hour service cycle.

## Table 51
## Circumnavigation of Kodiak Island

| | Day # | 2400 hour clock | | Decimal Hours | | | |
|---|---|---|---|---|---|---|---|
| | | Arrive | Depart | Transit Duration | Port Time | Link Duration | Cumulative Duration |
| **Kodiak** | **1** | | 0000 hrs | | | 0.0 hrs | 0.0 hrs |
| **Old Harbor** | **1** | 0830 hrs | 0930 hrs | 8.50 hrs | 1.0 hrs | 9.50 hrs | 9.50 hrs |
| **Akhiok** | **1** | 1530 hrs | 1730 hrs | 6.00 hrs | 2.0 hrs | 8.00 hrs | 17.50 hrs |
| **Karluk** | **2** | 0015 hrs | 0115 hrs | 6.75 hrs | 1.0 hrs | 7.75 hrs | 25.25 hrs |
| **Larsen Bay** | **2** | 0345 hrs | 0545 hrs | 2.50 hrs | 2.0 hrs | 4.5 hrs | 29.75 hrs |
| **Port O'Brien** | **2** | 1015 hrs | 1045 hrs | 4.50 hrs | 0.5 hrs | 5.0 hrs | 34.75 hrs |
| **Port Bailey** | **2** | 1415 hrs | 1445 hrs | 3.50 hrs | 0.5 hrs | 4.00 hrs | 38.75 hrs |
| **Ouzinkie** | **2** | 1900 hrs | 2000 hrs | 4.25 hrs | 1.0 hrs | 5.25 hrs | 44.00 hrs |
| **Kodiak** | **2** | 2200 hrs | 0000 hrs | 2.00 hrs | 2.0 hrs | 4.0 hrs | 48.00 hrs |

The possibility exists that running distance and schedule time could be saved by using Narrow Strait and Ouzinkie Narrows on the run from Port Bailey to Ouzinkie rather than routing completely around Spruce Island. The savings in running distance is approximately 17 n.m. and the time savings might be on the order of 1 hour 30 minutes.

### Intra-Kodiak Borough Vessel

A ferry vessel to serve the roadless outports of Kodiak Island must be seaworthy and yet capable of negotiating narrow passages and approaching docks and piers with limited depths of water alongside. Some of the communities to be served (e.g., Akhiok) are unapproachable by any vessel that might be regarded as reasonable draft for the circumnavigation of Kodiak Island. Hence the ferry must be capable of carrying its own lighter aboard. That lighter should be shoal draft, between 30 and 40 feet overall. The ferry must be capable of carrying, launching and retrieving this lighter. The lighter will definitely be used to serve Akhiok and most likely used for Old Harbor, Karluk, Larsen Bay and Ouzinkie.

It is judged that a vessel of about 150 feet length over all and with a nominal passenger capacity of 49 would be suitable for this service. The vessel should be twin screw for reliability and should be outfitted with a bow thruster. For seaworthy performance it should have a forecastle providing adequate freeboard forward. The operating draft

must be a compromise between seakeeping performance and the ability to transit restricted depth passages. The final selection of draft should be the subject of further study.

Following is a concept design for an Intra-Kodiak Borough ferry, showing the lighter carried on the aft deck.

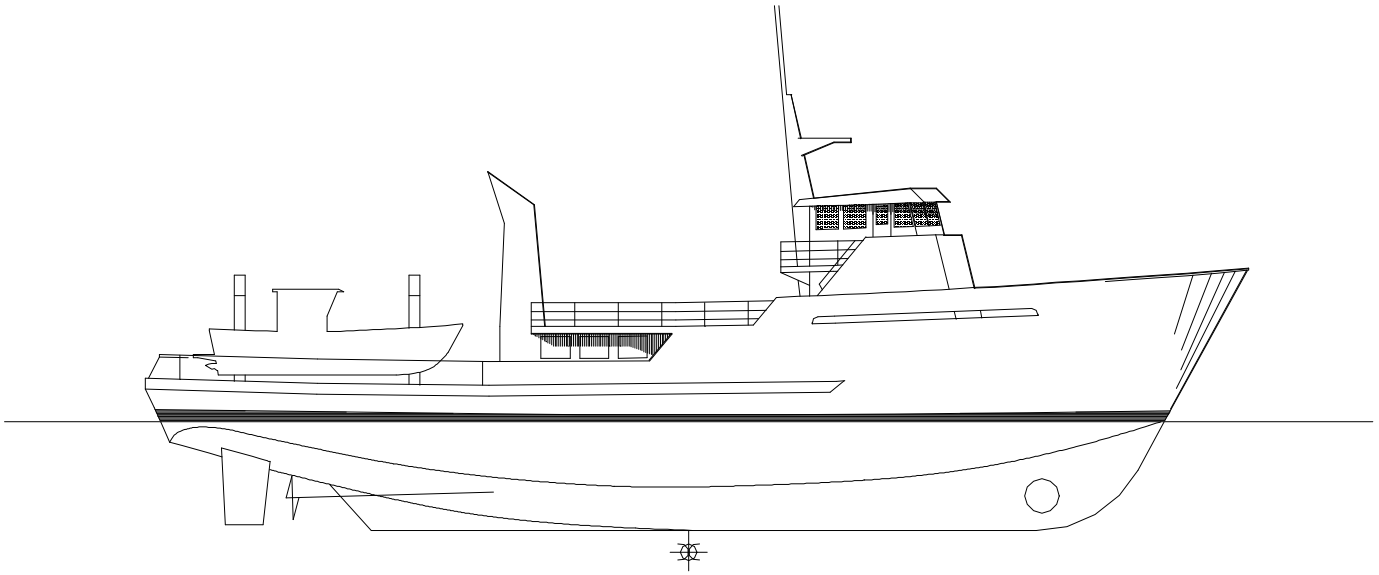


Figure 23
Concept Sketch of Kodiak Intra-Borough Ferry

## COST

Capital, operating and life-cycle costs are estimated for the basis vessel operating according to the model schedule.

### *CAPITAL COST*

The construction cost of a new vessel similar to the basis vessel is estimated in the range of $3.0 to $3.5 million. The cost range is influenced by classification and regulatory requirements, extent of outfitting, delivery voyage costs and acquisition scheme. This cost includes an allowance for the lighter aboard ship and the associated launching/retrieval system.

## OPERATING COSTS

Operating costs are estimated for the basis vessel operating in accordance with the model schedule.

### Crew Costs

Table 52 shows current (1998) compensation rates as negotiated between AMHS and the Inland Boatman's Union (IBU); Masters, Mates and Pilots Union (MMP); and the Marine Engineer's Benevolent Association (MEBA). Hourly base rates are for Alaska resident crew. In accordance with advice received from AMHS benefits are shown as 38% of base pay rates. This benefits allowance includes the effect of paid leave. Daily rates assume twelve paid hours per day.

Table 52
Crew Compensation Rates by Position

| Position | Hourly Base | Benefits | COLA | Total Hourly | Daily |
|---|---|---|---|---|---|
| **Master** | $18.08 | $6.87 | $3.62 | $28.57 | $342.84 |
| **Ch. Mate** | $16.01 | $6.08 | $3.20 | $25.29 | $303.48 |
| **2nd Mate** | $15.45 | $5.87 | $3.09 | $24.41 | $292.92 |
| **Ch. Engineer** | $17.61 | $6.69 | $3.52 | $27.82 | $333.84 |
| **1st Asst. Engr.** | $16.36 | $6.22 | $3.27 | $25.85 | $310.20 |
| **2nd Asst. Engr.** | $15.82 | $6.01 | $3.16 | $24.99 | $299.88 |
| **A.B.** | $14.12 | $6.57 | $3.17 | $23.86 | $286.32 |
| **Watchman** | $13.23 | $6.16 | $2.98 | $22.37 | $268.44 |
| **Cook** | $13.82 | $6.44 | $3.13 | $23.39 | $280.68 |

As the circumnavigation exceeds twelve hours two complete watches are required. It is conceivable that the master and chief engineers could each stand watches in this Intra-Kodiak Borough service but fiscal prudence suggests that it be assumed that neither the master nor the chief engineer stand watches. A single watch comprises four persons: a watch-standing mate, two able-bodied seamen (A.B.'s), and a watch-standing assistant engineer. The able-bodied seamen take turns during the watch as quartermaster (helmsman). The A.B. not acting as the quartermaster is available to act as lookout[6] or, when not required to act as lookout, the non-quartermaster A.B. can perform cleaning and deck maintenance duties. For a passenger vessel operating in hours of darkness a patrolman is required[7]. Given the 48-hour duration of each circumnavigation cycle food service for both the crew and passengers would be required. Thus the crew of for the Kodiak Intra-Borough ferry service could consist of twelve persons, eight watch-standers plus the master, the chief engineer, the watchman, and the cook, as indicated in Table 53.

[6] Navigation regulations require the posting of a lookout during periods of restricted visibility.

[7] A watchman is required if no passenger sleeping accommodations are provided, otherwise a patrolman is required. The differences are operational regarding the duties assigned. The crew position exists in either case.

Table 53
Crew Costs for the Kodiak Intra-Borough Ferry Service

| Position | No. | Daily | 308 Days (44 Weeks) |
|---|---|---|---|
| **Master** | 1 | $342.84 | $105,595 |
| **Ch. Mate** | 1 | $303.48 | $93,472 |
| **2nd Mate** | 1 | $292.92 | $90,219 |
| **Ch. Engineer** | 1 | $333.84 | $102,823 |
| **1st Asst. Engr.** | 1 | $310.20 | $95,542 |
| **2nd Asst. Engr.** | 1 | $299.88 | $92,363 |
| **A.B.** | 4 | $1,145.28 | $352,746 |
| **Watchman** | 1 | $268.44 | $82,680 |
| **Cook** | 1 | $280.68 | $86,449 |
| **TOTAL** | **12** | **$3,577.92** | **$1,101,889** |

The acquisition cost for the Kodiak Intra-Borough ferry is between $3.0 M and $3.5 M. Table 54 summarizes the annual operating costs for service according to the model schedule. Annual operating costs are between $2.11M and $2.19M.

Operating costs shown in Table 54 are consistent with the operating cost analysis given in the "Juneau Access Marine Alternatives Study," March 1999, prepared for Alaska DOT&PF by The Glosten Associates, Inc. Overhead costs for: i)ports and terminals; ii)management; and iii)shoreside, are based on fiscal year 1998 vessel operating costs provided by AMHS[8]. Overhead costs in Southwest Alaska were pro-rated according to vessel operating hours.

[8] Fiscal year 1998 vessel operating cost spreadsheet "Fy98_vsl.xls" prepared by B. Braley, dated 10/15/98.

## Table 54
## Acquisition, Operating and Life-Cycle Cost Summary for Intra-Kodiak Borough Ferry

| | Minimum | Maximum |
|---|---|---|
| Vessel Acquisition Cost | $3,000,000 | $3,500,000 |
| Subtotal: (Acquisition Cost) | $3,000,000 | $3,500,000 |
| Hull Maintenance & Pass. Services Maint. | $44,000 | $51,000 |
| Machinery Maintenance | $128,000 | $156.000 |
| Crew | $1,101,889 | $1,101,889 |
| Fuel | $216,000 | $264,000 |
| Lubricating Oil | $4,900 | $6,000 |
| Ports and Terminals O.H. | $223,176 | $223,176 |
| Management O.H. | $366,741 | $366,741 |
| Shoreside O.H. | $69 | $69 |
| Insurance | $23,000 | $26,000 |
| Subtotal: (Annual Operating Cost) | $2,107,775 | $2,194,875 |
| 20-Year Life Cycle Cost (i=3%) | | |
| Present Value | $35,299,121 | $37,133,824 |
| Uniform Equivalent Annual Cost | $2,303,549 | $2,423,278 |
| 20 Year Life Cycle Cost (i=7%) | | |
| Present Value | $26,892,884 | $28,380,215 |
| Uniform Equivalent Annual Cost | $2,372,428 | $2,503,637 |

Life cycle costs and uniform equivalent annual costs were computed based on two different assumptions regarding discount rate. The lower discount rate of 3% is the same as used in the Fleet Management Section of the1991 AMHS "Fleet Condition and Asbestos Survey." A discount rate of 4% has recently been recommended for use with Federal Aid projects. The discount rate of *i*=7% corresponds to the discount rate used for life cycle costs and other discounted cash flow calculations in the Draft Juneau Access EIS. While the life cycle costs (i.e., present value in Table 51) show considerable sensitivity to discount rate the equivalent uniform annual costs are only slightly affected by the choice of discount rate. The twenty-year life cycle costs range between $26.9M and $37.1M (1999 dollars). And the equivalent uniform annual cost is between $2.304M and $2.504M (1999 dollars).

### *ANNUAL COST BY LINK*

Table 55 presents the annual cost of the Intra-Kodiak Borough by link, apportioned to each link according to annual vessel link miles.

## Table 55
## Kodiak Intra-Borough Ferry Service – Annual Cost by Link

| Annual Operating Cost Pro-Rated by Vessel Miles | | | | |
|---|---|---|---|---|
| | Trips | Link Length (n.m.) | Vessel Miles | Cost |
| **Kodiak – Old Harbort** | 154 | 93 | 14,322 | $506,510 |
| **Old Harbor – Akhiok** | 154 | 64 | 9,856 | $348,566 |
| **Akhiok – Karluk** | 154 | 73 | 11,242 | $397,583 |
| **Karluk – Larsen Bay** | 154 | 27 | 4,158 | $147,051 |
| **Larsen Bay- Port O'Brien** | 154 | 47 | 7,238 | $255,978 |
| **Port O'Brien- Port Bailey** | 154 | 37 | 5,698 | $201,515 |
| **Port Bailey- Ouzinkie** | 154 | 43 | 6,622 | $234,193 |
| **Ouzinkie – Kodiak** | 154 | 19 | 2,926 | $103,480 |
| **Total (44 week service year)** | | | **62,062** | **$2,194,875** |

And Table 56 gives the trip costs by link.

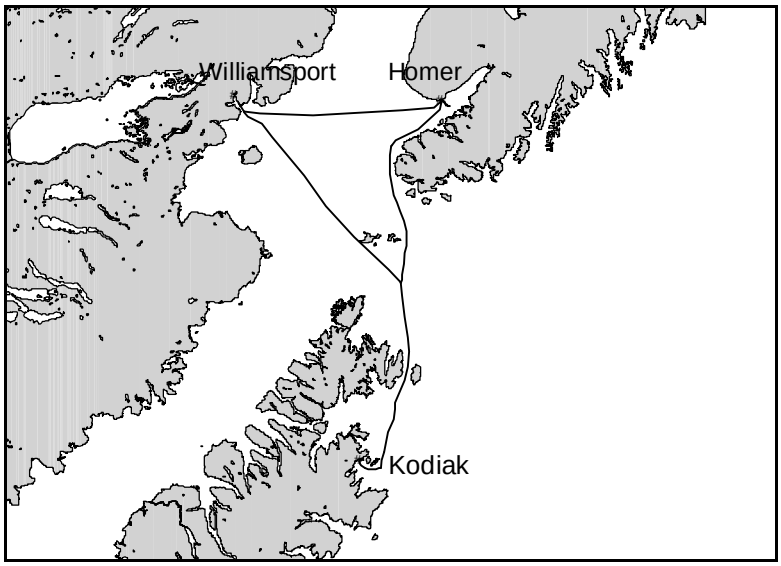
## Table 56
## Kodiak Intra-Borough Ferry Service – Trip Cost by Link

| Operating Cost Pro-Rated to Link by Miles | | |
|---|---|---|
| | Link Length (n.m.) | Cost |
| **Kodiak – Old Harbort** | 93 | $3,289 |
| **Old Harbor – Akhiok** | 64 | $2,263 |
| **Akhiok – Karluk** | 73 | $2,582 |
| **Karluk – Larsen Bay** | 27 | $955 |
| **Larsen Bay- Port O'Brien** | 47 | $1,662 |
| **Port O'Brien- Port Bailey** | 37 | $1,309 |
| **Port Bailey- Ouzinkie** | 43 | $1,521 |
| **Ouzinkie – Kodiak** | 19 | $672 |
| **Total (44 week service year)** | **403** | **$14,252** |

Demand for this service has been estimated at 7,400 passengers per year. Vehicle service would not be provided.

# MARINE ALTERNATIVES EXPLORED BUT WITHDRAWN FROM FURTHER EVALUATION

## HOMER–WILLIAMSPORT–KODIAK MARINE LINK




This alternative was dropped from further consideration because it was determined that service could be more efficiently reconfigured with separate vessels. The link between Homer and Williamsport has been reconfigured as the Homer-Seldovia-Williamsport marine link, while service from the Kenai Peninsula to Kodiak would be provided more frequently under the dedicated *Tustumena* marine link. Nonetheless, the technical analysis underlying this configuration is provided for comparison.

### Making Regional Connections

Williamsport, at the terminus of the Williamsport-Pile Bay Road, gives access to Iliamna Lake from Cook Inlet. Continuing along the Kvichak River, one can travel all the way across the Peninsula to Bristol Bay. As such, a relatively small improvement—making Williamsport more navigable—could have a significant impact in terms of improving access to the large Bristol Bay region. Extending marine service to Williamsport would also provide inland communities such as Pile Bay, Pedro Bay, Iliamna, and Nondalton. In addition, if the proposed Iliamna-Pedro Bay-Pile Bay road were also built, this marine link would give these communities a link to Alaska's mainland surface transportation network, including Anchorage. However, this link could not be made without a major infrastructure improvement: the dredging of Williamsport.

Williamsport, which lies at the terminus of the Williamsport-Pile Bay Road, is currently "inaccessible by sea except for brief periods at the peak of extreme high tides which occur a few days each month. In spite of this extraordinary limitation, landing craft approach Williamsport regularly to offload cargo bound for the communities of Iliamna

Lake. The road is also used for truck transport of commercial fishing vessels from Cook Inlet to Iliamna Lake, where vessels can sail to Bristol Bay via the lake and Kvichak River. The owners of the vessels prefer to take advantage of more affordable maintenance, repair and storage services on the Kenai Peninsula (eastern Cook Inlet), versus using much more expensive arrangements in Bristol Bay. A navigation improvement to increase access to Williamsport and enhance the transfer of cargo would significantly reduce transportation cost for cargo and fishing vessels" (*Navigation Channel Feasibility Report and Environmental Assessment*, US Army Corps of Engineers).

The US Army Corps of Engineers has studied alternative navigation improvements to increase access to Williamsport. The preferred alternative would consist of excavation of a channel 2,700 meters long and 30 meters wide at 0.5 meters below Mean Lower Low Water. This alternative's estimated cost would be $3,822,000 to construct and an average of $185,000 annually for maintenance, which would include "grading of the dock, ramp, and staging area; annual surveys the first four years, then every five years; maintenance dredging every ten years; and replacement of the sheet pile after 30 years." The Army Corps of Engineers' cost benefit analysis found that average annual benefits would exceed average annual costs by a ratio of 3.1:1.

In contrast to Williamsport, which would require major infrastructure improvements in order to implement the service concept envisioned, Kodiak and Seldovia would not require major infrastructure improvements. Insofar as the communities area already equipped with the requisite infrastructure, the service proposed could essentially be treated as an "add-on."

## The Project

The type of vessel envisioned to serve this link would be a modified offshore supply vessel with a RoRo type ramp and capacity for six passengers, as well as 10 vehicles or 200 tons of cargo. It is estimated that operating such a vessel would require from 8-14 crew. The approximate dimensions of such a vessel follow: about 120 feet long and about 37 feet wide, with a hull depth of 14 feet and a nominal draft of less than or equal to 10 feet.

Distances between Homer and Kodiak and Kodiak and Williamsport are nearly identical, at about 136 n.m. As such, at an operating speed of 9-10 knots, either leg of the trip could be made in just under 14 and a half hours.

As reflected in the model schedule, (Table ), it would be feasible to serve Homer (serving as homeport) three times in a week, with two port calls per week in Kodiak and Williamsport. Long port layovers are provided in Williamsport to account for timing of the tides. Even if Williamsport were dredged, tides would still have to be taken into account in scheduling. While the dredging would allow vessels a larger window of time that they could be in port, and would improve navigational safety,[9] it would not remove the need to account for tides entirely.

[9] Dredging Williamsport would improve navigational safety by deepening the area's rocky bottom, which is littered with large, shifting rocks.

## Table 57
## Model Schedule

| | Arrival | | Departure | | Port Time | Sailing Time |
|---|---|---|---|---|---|---|
| | **Day** | **Time** | **Day** | **Time** | **Duration** | **Duration** |
| **Homer** | Monday | | | 6:00 | | 8:00 |
| **Williamsport** | Monday | 14:00 | Tuesday | 2:00 | 12:00 | 14:13 |
| **Kodiak** | Tuesday | 16:13 | Tuesday | 18:13 | 2:00 | 14:19 |
| **Homer** | Wed | 8:32 | Wed | 10:32 | 2:00 | 14:19 |
| **Kodiak** | Thursday | 0:51 | Thursday | 2:51 | 2:00 | 14:13 |
| **Williamsport** | Thursday | 17:04 | Friday | 5:04 | 12:00 | 8:00 |
| **Homer** | Friday | 13:04 | | | | |

## Operational Issues

It may be most efficient to combine Williamsport-Homer-Kodiak service with the Intra-Kodiak Island service concept. However, if these services were not combined, it is suggested that the Williamsport run be operated as a simple run from Williamsport to Homer, without the long trek down to Kodiak. For connections to Kodiak, existing AMHS service (*Tustumena* or *Kennicott*) could be used.

Although the prospect of dedicating a vessel to Williamsport-Homer might seem extravagant (and may well turn out to be), it would have the operational advantages in terms of a much more direct Williamsport-Homer connection, and the vessel would also avoid sailing the known rough waters off the Barren Islands. The run to Kodiak from either Williamsport or Homer would have to cross Kennedy and Stevenson entrances near the Barren Islands, which is noted for extremely steep seas. Such a strategy would also make it easier for the vessel to time its departures from Homer to match the tides at Williamsport.

Speed might be an issue insofar as it would be desirable (but not easily achievable, at an operating speed of 9.5 knots) to complete the 152 n.m. round trip from Homer to Williamsport in a 12-hour period to take advantage of crewing efficiencies that accrue to vessels in dayboat service (i.e., no more than 12 hours service).

## Costs

Table 58
Estimated Vessel Acquisition and Operating Costs

| | Minimum | Maximum |
|---|---|---|
| Vessel Acquisition Cost | $3,500,000 | $4,000,000 |
| Subtotal: (Acquisition Cost) | $3,500,000 | $4,000,000 |
| Hull Maintenance | $15,800 | $19,300 |
| Machinery Maintenance | $5,600 | $6,800 |
| Crew | $1,012,100 | $2,787,400 |
| Fuel | $407,000 | $509,000 |
| Lubricating Oil | $5,900 | $7,400 |
| Berthing | $13,100 | $16,100 |
| Insurance | $125,000 | $167,000 |
| Subtotal: (Annual Operating Cost) | $1,584,500 | $3,513,000 |

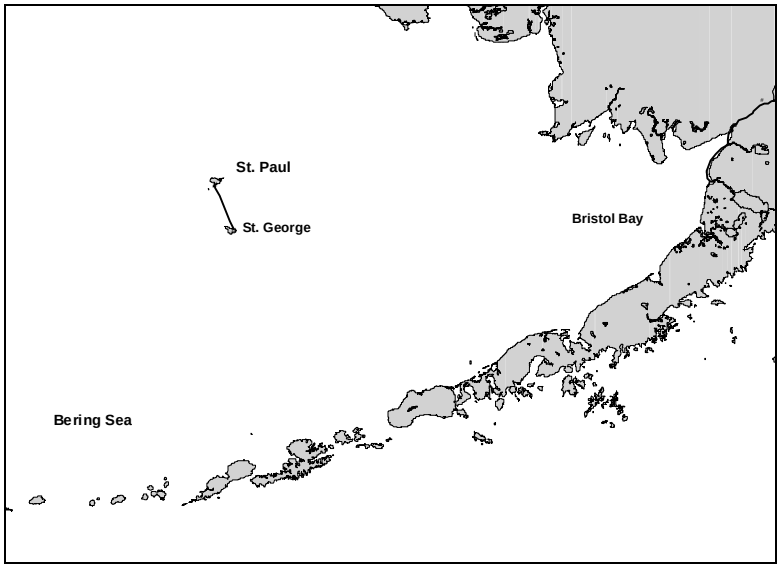
Table 59
Estimated Shoreside Infrastructure and Maintenance Costs

| | | |
|---|---|---|
| Shoreside Infrastructure Costs | $3,822,000 | — |
| Shoreside Maintenance Costs (annual) | $185,000 | — |

## Estimated Demand

Service demand under this configuration was estimated at 15,000 passengers and 3,610 vehicles per year.

## ST. PAUL–ST. GEORGE MARINE LINK




This marine link was withdrawn from further evaluation because its expected benefits relative to cost are very low, and because its potential for improving regional mobility and access is limited by the remoteness of the ports served.

### Making Regional Links

St. George, with a population of 201, and St. George, with a population of 767, lay 40 n.m. apart, across open, exposed Bering Sea waters. Scheduled flights between the islands and the mainland are available, but neither island currently has access to marine passenger service. Connecting these communities via marine service would provide social and cultural benefits primarily.

### The Project

The type of vessel best suited to provision of service between the Pribilof Islands of St. Paul and St. George would be an off-shore crew boat with some open deck space, and capacity for six passengers and about 14 vehicles. The principal dimensions of such a vessel are as follow: LOA about 100-120 feet; beam about 37 feet; hull depth 14 feet; with a nominal draft of ≤10 feet. A crew of 2-6 would be needed to operate such service.

### Operational Issues

At eight to ten knots, half of the 80 n.m. round trip would take between four and five hours; as such the round trip could easily be completed within a 12-hour day. Demand is estimated to warrant perhaps three to four trips per week.

## Costs

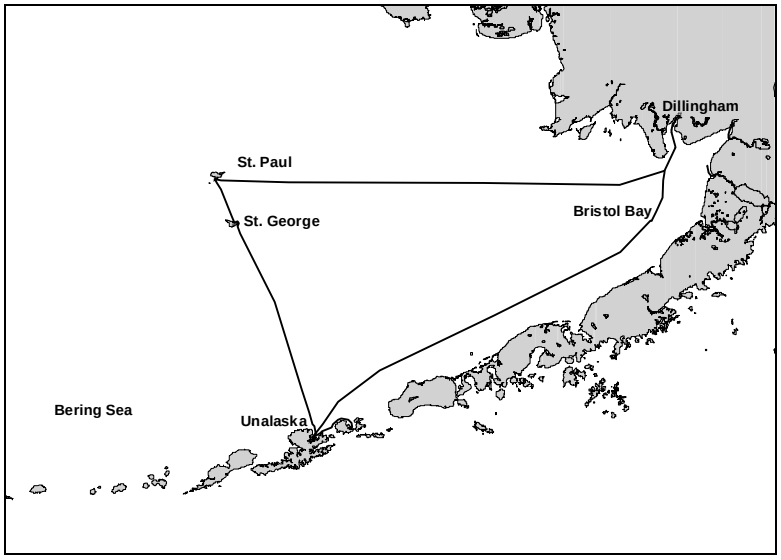
Table 60
Estimated Vessel Acquisition and Operating Costs

| | Minimum | Maximum |
|---|---|---|
| Vessel Acquisition Cost | $3,500,000 | $4,000,000 |
| Subtotal: (Acquisition Cost) | $3,500,000 | $4,000,000 |
| Hull Maintenance | $8,800 | $10,800 |
| Machinery Maintenance | $5,600 | $6,800 |
| Crew | $145,000 | $673,000 |
| Fuel | $104,700 | $130,900 |
| Lubricating Oil | $1,500 | $1,900 |
| Berthing | $13,000 | $16,100 |
| Insurance | $97,100 | $128,800 |
| Subtotal: (Annual Operating Cost) | $375,700 | $968,300 |

## Estimated Demand

Demand for this marine link is estimated at 3,800 passengers and 1,300 vehicles per year.

## UNALASKA–PRIBILOFS–DILLINGHAM MARINE LINK




This marine link was withdrawn from further evaluation because of its extremely high costs, due to both the long distances between ports and the need to schedule around tides at Dillingham.

### Making Regional Links

Unalaska is the only of these three communities currently receiving AMHS service. The *Tustumena* makes about eight AMHS port calls in Unalaska each year, between April and October. Instituting marine service between these communities would provide residents of the remote Pribilofs with another transportation mode choice for both passengers and freight, as well as enhancing ferry service to Unalaska. The distances involved are considerable, across the Bering Sea's open water. The longest run along this service would be the 422 nautical miles between Unalaska and Dillingham. Given an operating speed of 10 knots, this leg of the trip would take about 42 hours.

This service would create a loop linking the most important fishing port of the Aleutian Islands, across the Bering Sea to the Pribilofs, and back to the Alaskan mainland with the connection at Dillingham. Another benefit would be to provide the Pribilofs and Dillingham with a linkage to Unalaska's frequent container liner service, which would enhance these communities' ability to ship their fish product out to the Far East and the lower 48, as well as receiving cargo ranging from commercial fishing supplies to consumer goods. In fact, from the perspective of the Pribilofs or Dillingham, shipping freight via Unalaska would be much more efficient than routing freight through Anchorage, the standard node.

## The Project

The vessel envisioned to serve this link would consist of a new offshore supply vessel type hull, designed/modified for Bering Sea/Bristol Bay service. The approximate dimensions of such a vessel are as follow: LOA about 150 feet; Beam about 40-47 feet; Draft ≤ 8 feet. Such a vessel could carry some vans. At a service speed of 10-12 knots, once a week service would be possible. It is estimated that operating this service would require between 6-14 crew.

The Unalaska–Pribilofs–Dillingham Model Schedule (Table 61) spans nearly two weeks, although other schedules are possible. Notice that this model schedule includes extra trips between Unalaska and Dillingham during the two-week period. It also includes "going around the circuit" twice, once in each direction (clockwise and counterclockwise).

Table 61
Model Schedule

| | Arrival | | Departure | | Port Time | Sailing Time |
|---|---|---|---|---|---|---|
| | **Day** | **Time** | **Day** | **Time** | **Duration** | **Duration** |
| **Unalaska** | Monday | | | 6:00 | | 16:15 |
| **St. George** | Monday | 22:15 | Tuesday | 0:15 | 2:00 | 3:20 |
| **St. Paul** | Tuesday | 3:35 | Tuesday | 9:35 | 6:00 | 1105 |
| **Dillingham** | Wed | 20:40 | Thursday | 10:40 | 14:00 | 11:10 |
| **Unalaska** | Friday | 21:50 | Saturday | 3:50 | 6:00 | 11:10 |
| **Dillingham** | Sunday | 15:00 | Monday | 5:00 | 14:00 | 11:05 |
| **St. Paul** | Tuesday | 16:05 | Tuesday | 22:05 | 6:00 | 3:20 |
| **St. George** | Wed | 1:25 | Wed | 3:25 | 2:00 | 16:15 |
| **Unalaska** | Wed | 19:40 | Thursday | 1:40 | 6:00 | 11:10 |
| **Dillingham** | Friday | 12:50 | Friday | 2:50 | 14:00 | 11:10 |
| **Unalaska** | Sunday | 14:00 | | | | |

## Operational Issues

There are no roads to speak of on either St. George of St. Paul. It would be difficult to develop Roll-on/Roll-off access (i.e., over the beach RoRo) in Dillingham. Hence, it is proposed that the vessel be provided with break bulk cargo and 20-foot container lift-on/lift off (LoLo) capability. Such capability would also be suitable for lifting on and off vehicles carried as cargo.

Alternatively, if it were considered important that the vessel be capable of handling RoRo traffic, then it could be provided with a vehicle elevator/turntable similar to that on the *Tustumena* and *Kennicott*. Such a vehicle elevator/turntable system would permit the proposed vessel to handle RoRo vehicular traffic from existing public (e.g., city) and/or cannery docks. In either event, the proposed vessel would be capable of

handing cargo and modest-sized vehicles to and from existing public and/or cannery docks. Hence shoreside improvements would be required to implement such service.

Given the shallow water at Dillingham, with docks accessible only at or near high tide, scheduling would be constrained to some extent by tides, with layovers or idle time of up to six hours required. The port of Dillingham is affected by sea and river ice, restricting the ice-free navigation season to approximately May 1 through October 31. Though Bering Sea ice occasionally extends to the Pribilof Islands, it historically has not been an impediment to year-round navigation.

## Costs

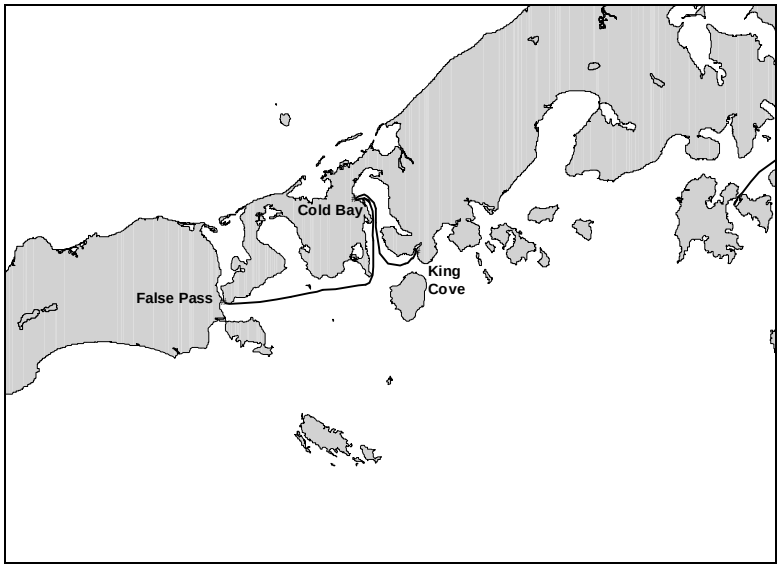
Table 62
Estimated Vessel Acquisition and Operating Costs

| | Minimum | Maximum |
|---|---|---|
| Vessel Acquisition Cost | $7,000,000 | $9,000,000 |
| Subtotal: (Acquisition Cost) | $7,000,000 | $9,000,000 |
| Hull Maintenance | $11,500 | $14,100 |
| Machinery Maintenance | $9,000 | $11,000 |
| Crew | $443,000 | $1,554,000 |
| Fuel | $415,000 | $519,000 |
| Lubricating Oil | $6,000 | $7,500 |
| Berthing | $3,200 | $13,000 |
| Insurance | $204,000 | $292,000 |
| Subtotal: (Annual Operating Cost) | $1,091,700 | $2,410,600 |

## Estimated Demand

Demand for this marine link is estimated at 3,800 passengers and 1,300 vehicles per year.

# KING COVE–COLD BAY–FALSE PASS MARINE LINK




## Making Regional Links

This alternative includes False Pass, which is located 57 n.m. east of Cold Bay, to a service loop between King Cove and Cold Bay. False Pass, with a 1996 population of 96, would benefit from access to King Cove's educational, health, and government services, as well as having a connection to Cold Bay's superior airport connection. For King Cove and Cold Bay, the benefit of adding False Pass to the service would be to spread the service costs among a greater population and to take advantage of market demand in False Pass to help make the service more viable.

## The Project

The type of vessel proposed for this marine link would be an ice-capable landing craft. The principal dimensions of such a vessel would be: LOA about 150 feet; beam about 47 feet and draft ≤ 3.8 to 6 feet. Some additional modifications would be required to operate in the unprotected waters between False Pass and Cold Bay/King Cove. These additional modifications, which would be assumed to add about 5 percent to the vessel's cost, would consist of the following:

- Add focsle with partial, hinged deck above bow ramp
- Increase bulwark height
- Add raised, grated main deck
- Increase size of freeing ports

One daily round trip between Cold Bay and King Cove is envisioned, except for the day that the vessel were making the run to False Pass. Four to six crew would be required.

## Operational Issues

Extending service to False Pass could provide some additional demand to support a ferry service between King Cove and Cold Bay. This could be done by running the King Cove–Cold Bay run several times per week, and running False Pass service once a week. Service from Cold Bay to King Cove could be run once or twice daily. The leg from King Cove to False Pass is about 47 n.m. At a speed of about 9 knots, this leg of the voyage could be completed in about five hours and 15 minutes. The vessel would layover in False Pass, and the next day would make the return trip to Cold Bay, which, at a distance of 57 n.m., could be reached in a little under six and a half hours.

## Costs

Table 63
Estimated Vessel Acquisition and Operating Costs

| | Minimum | Maximum |
|---|---|---|
| Vessel Acquisition Cost | $2,625,000 | $3,150,000 |
| Subtotal: (Acquisition Cost) | $2,625,000 | $3,150,000 |
| Hull Maintenance | $7,300 | $8,900 |
| Machinery Maintenance | $3,900 | $4,800 |
| Crew | $423,000 | $1,209,000 |
| Fuel | $132,000 | $165,000 |
| Lubricating Oil | $1,900 | $2,400 |
| Berthing (False Pass) | $2,100 | $2,600 |
| Insurance | $84,800 | $107,600 |
| Subtotal: (Annual Operating Cost) | $655,000 | $1,500,300 |